

ZXMN3A03E6

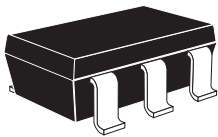
30V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}= 30V$ ;  $R_{DS(ON)}= 0.050\Omega$   $I_D= 4.6A$

DESCRIPTION

This new generation of TRENCH MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



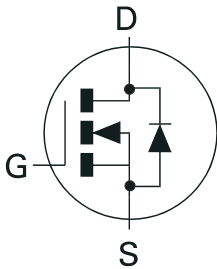
SOT23-6

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23-6 package

APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

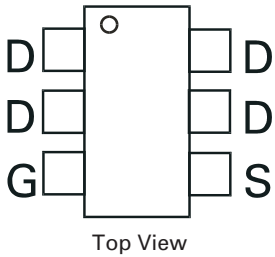


ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A03E6TA	7"	8mm	3000 units
ZXMN3A03E6TC	13"	8mm	10000 units

DEVICE MARKING

- 3A3



# ZXMN3A03E6

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current $V_{GS}=10V$ ; $T_A=25^\circ C$ (b) $V_{GS}=10V$ ; $T_A=70^\circ C$ (b) $V_{GS}=10V$ ; $T_A=25^\circ C$ (a)	$I_D$	4.6 3.7 3.7	A
Pulsed Drain Current (c)	$I_{DM}$	17	A
Continuous Source Current (Body Diode) (b)	$I_S$	2.6	A
Pulsed Source Current (Body Diode) (c)	$I_{SM}$	17	A
Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor	$P_D$	1.1 8.8	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	$P_D$	1.7 13.6	W mW/ $^\circ C$
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +150	$^\circ C$

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	113	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	73	$^\circ C/W$

### NOTES

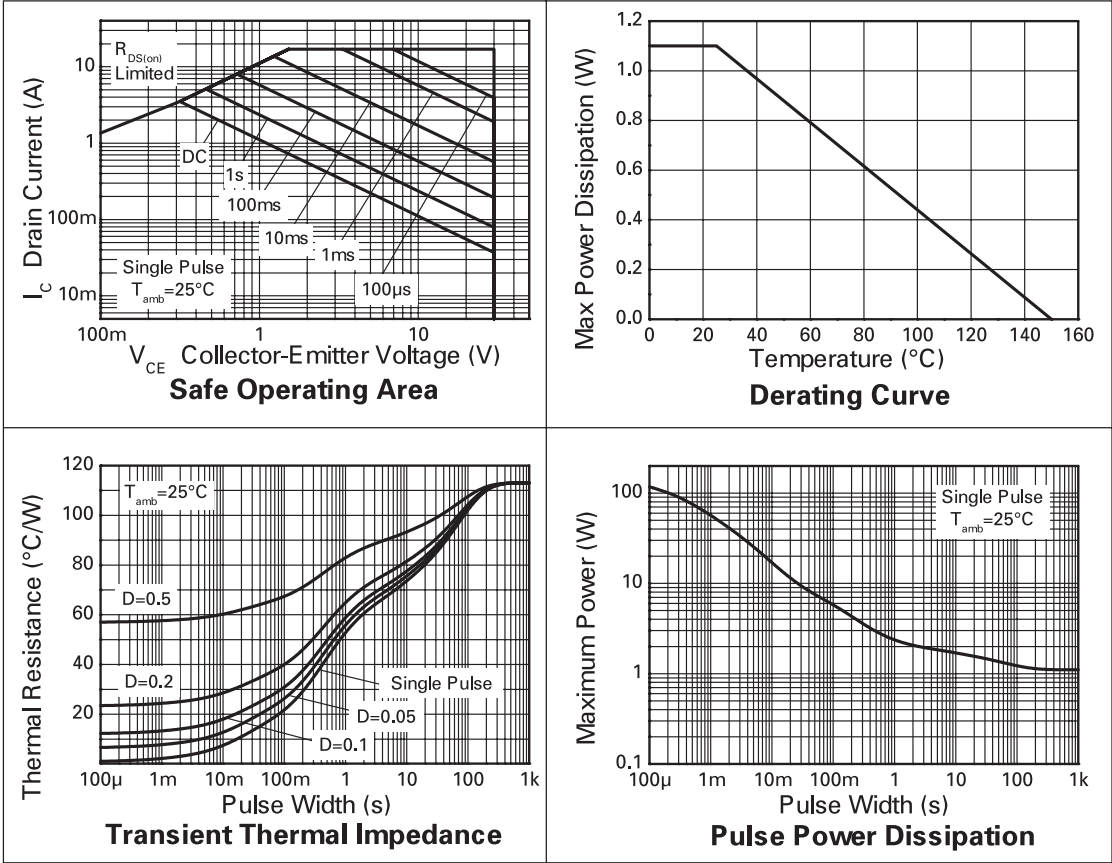
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at  $t \leq 10$  secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, D = 0.05, pulse width 10 $\mu s$  - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

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CHARACTERISTICS



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**ELECTRICAL CHARACTERISTICS** (at  $T_A = 25^\circ\text{C}$  unless otherwise stated).

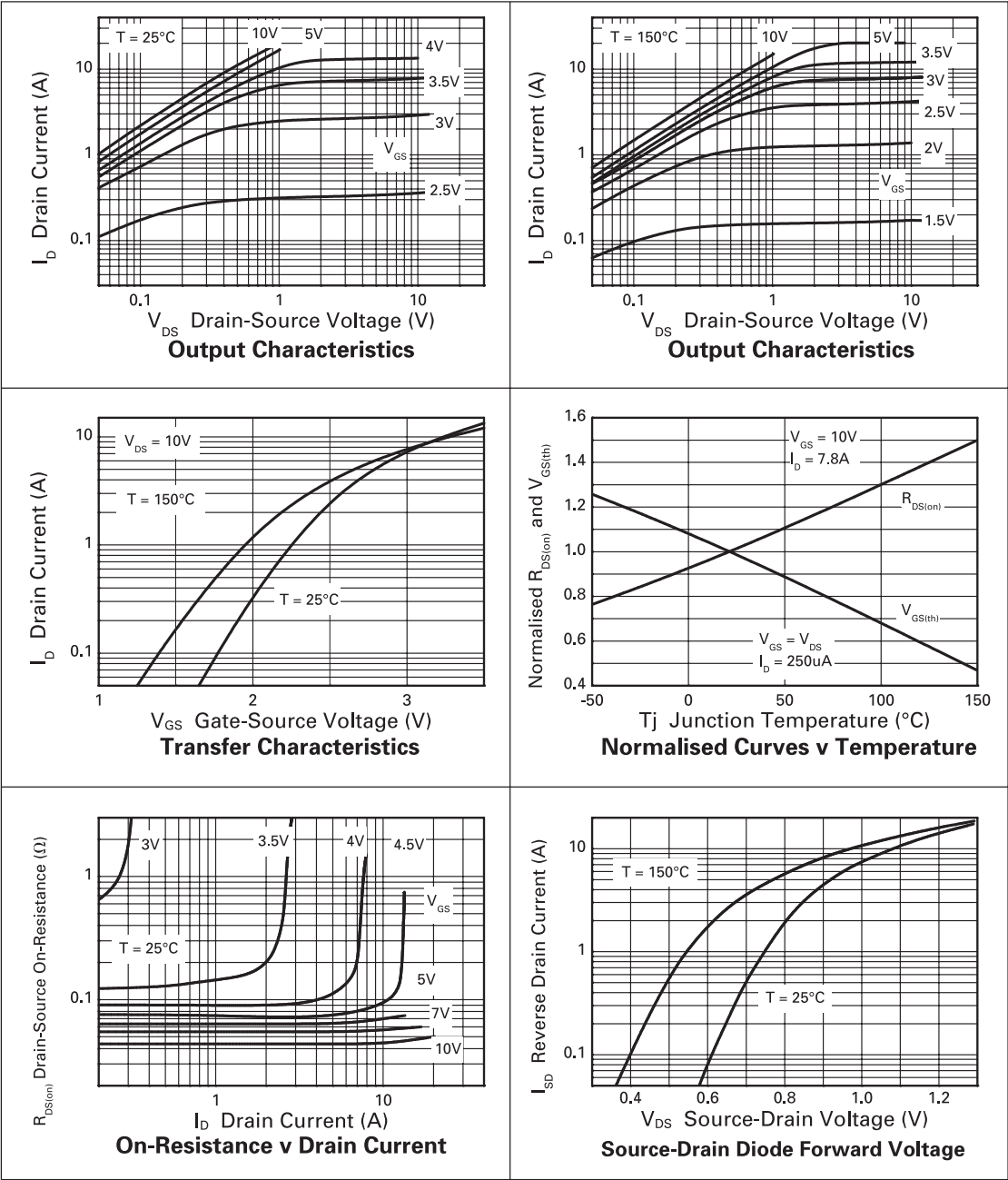
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	V(BR)DSS	30			V	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>			0.5	μA	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V
Gate-Body Leakage	I <sub>GSS</sub>			100	nA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	1			V	I <sub>D</sub> =250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-State Resistance (1)	R <sub>DS(on)</sub>			0.050 0.065	Ω Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =7.8A V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.8A
Forward Transconductance (1)(3)	g <sub>fs</sub>		10		S	V <sub>DS</sub> =10V,I <sub>D</sub> =7.8A
DYNAMIC (3)						
Input Capacitance	C <sub>iss</sub>		600		pF	V <sub>DS</sub> =25 V, V <sub>GS</sub> =0V, f=1MHz
Output Capacitance	C <sub>oss</sub>		104		pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		58.5		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	t <sub>d(on)</sub>		2.9		ns	V <sub>DD</sub> =15V, I <sub>D</sub> =3.5A R <sub>G</sub> =6.0Ω, V <sub>GS</sub> =10V
Rise Time	t <sub>r</sub>		6.4		ns	
Turn-Off Delay Time	t <sub>d(off)</sub>		16.0		ns	
Fall Time	t <sub>f</sub>		11.2		ns	
Gate Charge	Q <sub>g</sub>		6.9		nC	V <sub>DS</sub> =15V,V <sub>GS</sub> =5V, I <sub>D</sub> =3.5A
Total Gate Charge	Q <sub>g</sub>		12.6		nC	V <sub>DS</sub> =15V,V <sub>GS</sub> =10V, I <sub>D</sub> =3.5A
Gate-Source Charge	Q <sub>gs</sub>		2.0		nC	
Gate-Drain Charge	Q <sub>gd</sub>		2.0		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V <sub>SD</sub>		0.85	0.95	V	T <sub>J</sub> =25°C, I <sub>S</sub> =3.2A, V <sub>GS</sub> =0V
Reverse Recovery Time (3)	t <sub>rr</sub>		18.8		ns	T <sub>J</sub> =25°C, I <sub>F</sub> =3.5A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q <sub>rr</sub>		14.1		nC	

## NOTES

- (1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .  
 (2) Switching characteristics are independent of operating junction temperature.  
 (3) For design aid only, not subject to production testing.

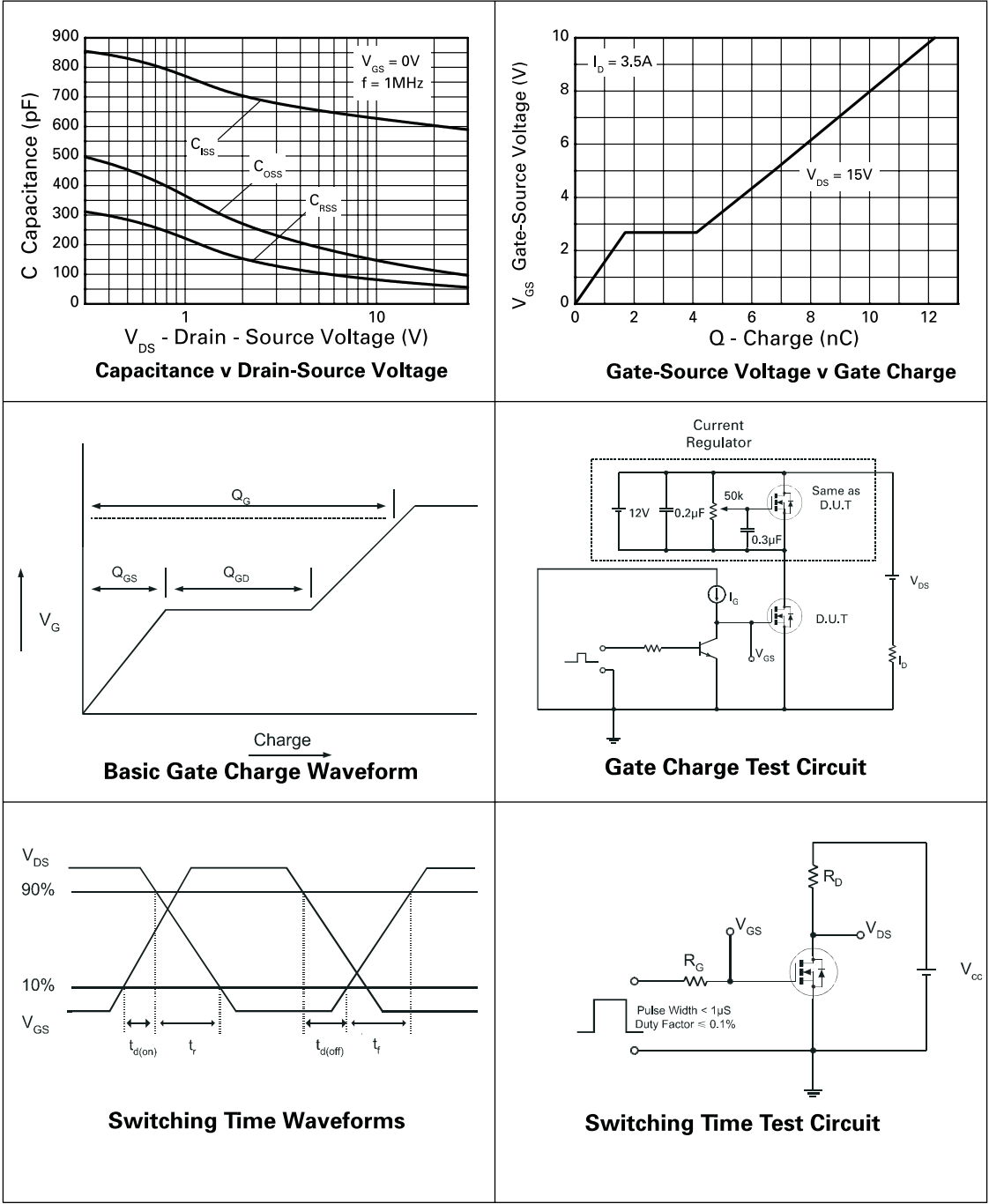
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TYPICAL CHARACTERISTICS



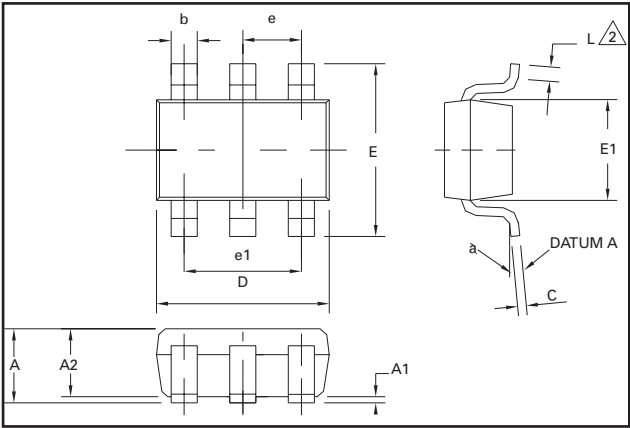
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TYPICAL CHARACTERISTICS

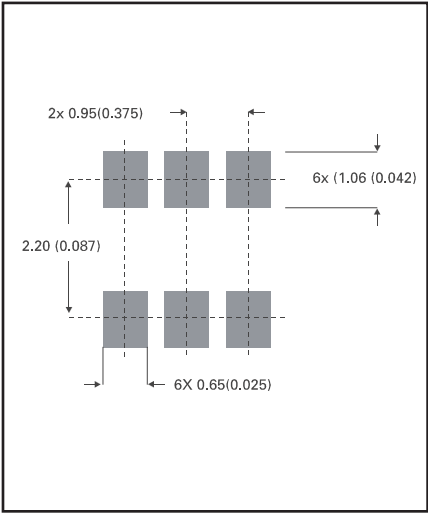


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## PACKAGE DIMENSIONS



## PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.35	0.057
A1	0.00	0.15	0	0.006
A2	0.90	1.30	0.035	0.051
b	0.35	0.50	0.014	0.019
C	0.09	0.20	0.0035	0.008
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	1.50	1.75	0.059	0.069
L	0.10	0.60	0.004	0.002
e	0.95 REF		0.037 REF	
e1	1.90 REF		0.074 REF	
L	0°	10°	0°	10°

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